WHAT IS CLAIMED IS:

1. A method for preparing a substrate for supporting at least one optical fiber, said method comprising:

providing a base substrate of a suitable material;

providing at least one longitudinally-extending groove along a longitudinally-extending axis of said substrate but less than its full length; and

providing at least a first transversely-extending trench across said substrate near one end thereof, prior to positioning said at least one optical fiber thereon.

2. A method for preparing a substrate for supporting a plurality of optical fibers, said method comprising:

providing a base substrate of a suitable material;

providing a longitudinally-extending, strain relief area at one end thereof along a longitudinal axis thereof;

providing a plurality of parallel longitudinally-extending grooves along said longitudinally-extending axis, said longitudinally-extending grooves abutting said strain-relief area; and

providing at least a first transversely-extending trench across said substrate, prior to positioning the plurality of optical fibers thereon.

3. The method of claim 1 or claim 2, wherein the strain-relief area extends longitudinally on both lateral sides of the first trench.

4. The method of claim1 or claim 2, wherein the strain-relief area extends longitudinally from said first trench only to said one end thereof.

5. The method of claim 1 or 2, wherein said strain-relief area extends longitudinally from said one end thereof to stop short of said first trench.

6. The method of any one of claims 1 to 5, including a second trench extending transversely across the substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench.

7. A method for preparing an element which supports at least one optical fiber, said method comprising:

(a) providing a bottom plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, providing at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, and providing at least a first transversely-extending trench across said substrate;

(b) providing a top plate in the form of a base substrate of suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinally axis thereof, providing at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove

abutting said strain-relief area, and providing at least a first transversely-extending trench across said substrate;

(c) disposing at least one optical fiber within said strain-relief area of either said bottom plate or said top plate and disposing at least one bare optical fiber within said at least one longitudinally-extending groove of either the bottom plate or said top plate; and

(d) preparing a precursor sandwich by superposing the top plate over said bottom plate with said at least one optical fiber therebetween in the strain-relief areas and with said at least one bare exposed optical fiber in said grooves and with a minor section of the top plate and said bottom plate of said precursor sandwich being glued together.

8. A method for preparing an element which supports a plurality of optical fibers, said method comprising:

(a) providing a bottom plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinally axis thereof, providing a plurality of parallel, longitudinally-extending grooves along the longitudinally-extending axis, said plurality of parallel longitudinally-extending grooves abutting said strain-relief are, and providing at least a first transversely-extending trench across said substrate;

(b) providing a top plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, providing a plurality of parallel longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel longitudinally-extending grooves abutting said strain-relief area, and providing at least a first transversely-extending trench across said substrate;

(c) disposing an array of optical fibers within said strain-relief area of either

said bottom plate or said top plate, and disposing a plurality of parallel bare optical fibers within said parallel longitudinally-extending grooves of either said bottom plate or said top plate; and

(d) preparing a precursor sandwich by superposing said top plate over said bottom plate with said array of optical fibers therebetween in said strain-relief areas and with said plurality of parallel bare exposed optical fibers in said grooves, and with a minor section of said top plate and the bottom plate of said precursor sandwich being glued together.

9. A method for preparing an element which supports at least one optical fiber, said method comprising:

(a) providing a bottom plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, providing at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, providing a first transversely-extending trench across said substrate, and providing a second trench extending transversely across said substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(b) providing a top plate in said form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinally-extending axis thereof, providing at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, providing a first transversely-extending trench across said substrate, and providing a second trench extending transversely across said substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(c) disposing at least one optical fiber within said strain-relief area of either said bottom plate or said top plate and disposing at least one bare optical fiber within said at least one longitudinally-extending groove of either said bottom plate or said top plate; and

(d) preparing a precursor sandwich by superposing said top plate over said bottom plate with said at least one optical fiber therebetween in said strain-relief areas and with said at least one bare exposed optical fiber in said grooves, and with a minor section of said top plate and said bottom plate of said precursor sandwich being glued together.

10. A method for preparing an element which supports a plurality of optical fibers, said method comprising:

(a) providing a bottom plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, providing a plurality of parallel longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel longitudinally-extending grooves abutting said strain-relief area, providing a first transversely-extending trench across said substrate, and providing a second trench extending transversely across said substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(b) providing a top plate in the form of a base substrate of a suitable material, providing a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, providing a plurality of parallel longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel longitudinally-extending grooves abutting said strain-relief area, providing a first transversely-extending trench across said substrate, and providing a second trench extending transversely across said

substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(c) disposing an array of optical fibers within the strain-relief area of either the bottom plate or the top plate and disposing a plurality of bare optical fibers within said plurality of parallel, longitudinally-extending grooves of either said bottom plate or said top plate; and

(d) preparing a precursor sandwich by superposing the top plate over said bottom plate with said array of optical fibers therebetween in the strain-relief areas and with said plurality of parallel bare exposed optical fibers in said plurality of parallel grooves, and with a minor section of said top plate and said bottom plate of said precursor sandwich being glued together.

11. The method of any one of claims 1 to 10, wherein the strain-relief area extends longitudinally on both lateral sides of said first trench.

12. The method of any one of claims 1 to 10, wherein said strain-relief area extends longitudinally from said first trench only to said one edge thereof.

13. The method of any one of claims 1 to 10, wherein said strain-relief area extends longitudinally from said one edge thereof to stop short of said strain-relief area.

14. The method of any one of claims 7 to 13, wherein said at least one optical fiber, or said array of optical fibers, and said at least one bare exposed optical fiber or the plurality of parallel bare exposed optical fibers is disposed at an angle beta to the central longitudinal axis of said precursor sandwich.

15. The method of any one of claims 7 to 14, including the additional steps of cutting said precursor sandwich adjacent an edge which is remote from said first trench, and

breaking away a portion of said top plate thereby exposing an end of said at least one bare exposed optical fiber or ends of the plurality of parallel bare exposed optical fibers; and

polishing said exposed end or ends

16. The method of claim 15, wherein the cut is tilted at an angle gamma to the vertical.

17. The method of claim 15, or claim 16, wherein the cut is cut completely through said top plate but only partly through said lower plate.

18. The method of claim 15, claim 16 or claim 17, wherein said cut is disposed at an angle beta to the longitudinal axis of said precursor sandwich.

19. The method of any one of claims 15 to 18, wherein said bare exposed optical fiber or said plurality of parallel bare exposed optical fibers are disposed at an angle to the longitudinal axis of said precursor sandwich.

20. The method of any one of claims 7 to 19, including the step of breaking said bottom plate of said precursor sandwich along said first trench, and removing a major unglued section of said bottom plate;

thereby providing a half-sandwich including said at least one bare exposed optical fiber or said plurality of parallel bare exposed optical fibers, both within said at least one groove or within said plurality of parallel grooves and depending from a face of said top plate.

21. The method of any one of claims 7 to 20, including the additional steps of breaking said top plate of said half-sandwich along said first trench of said top plate, and removing a major unglued section of said top plate;

thereby providing a full sandwich including a bare cantelevered optical fiber or a plurality of parallel bare exposed cantelevered optical fibers, which extend along the longitudinal axis of said full sandwich.

22. A method for the production of a waveguide, comprising the steps of:

providing a waveguide substrate, said waveguide substrate having two opposed lateral ends, each the lateral end including a plurality of parallel longitudinal grooves therein, and a central region abutting said lateral ends, said central region including a plurality of optical-fiber-coupling structures which abut said plurality of parallel longitudinal grooves;

providing two half-sandwiches as claimed in any one of claims 15 to 20; and

securing an associated said half-sandwich to an associated lateral end of said waveguide substrate, with said bare optical fibers within said plurality of parallel grooves of said waveguide substrate, and also in contact with said optical fiber coupling structures.

23. A method for the production of a waveguide, comprising the steps of:

providing a waveguide substrate, said waveguide substrate having two opposed lateral ends, each the lateral end including a plurality of parallel longitudinal grooves therein, and a central region abutting the lateral ends, said central region including a plurality of optical-fiber-coupling structures which abut said plurality of parallel longitudinal grooves;

providing two full sandwiches as claimed in claim 21; and

securing an associated said full sandwich to an associated lateral end of said waveguide substrate, with said bare optical fibers within said plurality of parallel grooves of said waveguide substrate, and also in contact with said optical fiber coupling structures.

24. A substrate for supporting at least one optical fiber, said substrate comprising:

a base substrate of a suitable material;

a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof;

at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area; and

at least a first transversely-extending trench across said substrate.

25. A substrate for supporting a plurality of optical fibers, said substrate comprising:

a base substrate of a suitable material;

a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof;

a plurality of parallel, longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel, longitudinally-extending grooves abutting said strain-relief area; and

at least a first transversely-extending trench across said substrate.

26. The substrate of claim 24 or claim 25, wherein the strain-relief area extends longitudinally on both lateral sides of said first trench.

27. The substrate of claims 24 or claim 25, wherein said strain-relief area extends longitudinally from said first trench only to said one end thereof.

28. The substrate of claim 24 or claim 25, wherein the strain-relief area extends longitudinally from the one end thereof to stop short of the first trench.

29. The substrate of any one of claims 24 to 28, including a second transversely-extending trench across said substrate at a location remote from said first trench and adjacent an end of said substrate which is remote from said first trench.

30. A precursor sandwich which supports at least one optical fiber, said precursor sandwich comprising:

(a) a bottom plate in the form of a base substrate of a suitable material, a

longitudinally extending strain-relief area at one end thereof along a longitudinal axis thereof, at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, and at least a first transversely-extending trench across said substrate;

(b) a top plate in the form of a base substrate of a suitable material, a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, and at least a first transversely-extending trench across said substrate;

(c) at least one optical fiber within said strain-relief area of either said bottom plate or the top plate, and at least one bare exposed optical fiber within said at least one longitudinally-extending groove of either said bottom plate or said top plate;

wherein:

(d) the precursor sandwich comprises said top plate which is superposed over said bottom plate, with said at least one optical fiber therebetween in said strain-relief area, and with said at least one bare optical fiber in said at least one longitudinally-extending groove, and further in which a minor section of said top plate and said bottom plate of said precursor sandwich has been glued together.

31. A precursor sandwich which supports a plurality of parallel optical fibers, said precursor sandwich comprising:

(a) a bottom plate in the form of a base substrate of a suitable material, a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, a plurality of parallel, longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel, longitudinally-extending grooves abutting said strain-relief area, and at least a first transversely-extending trench across said substrate;

(b) a top plate in the form of a base substrate of a suitable material, a

longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, a plurality of parallel, longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel, longitudinally-extending grooves abutting said strain-relief area, and at least a first transversely-extending trench across the substrate;

(c) an array of optical fibers within said strain-relief area of either said bottom plate or said top plate, and a plurality of parallel, bare exposed optical fibers within said plurality of parallel, longitudinally-extending grooves of either said bottom plate or said top plate;

wherein:

(d) said precursor sandwich comprises the top plate which is superposed over said bottom plate, with said array of optical fibers therebetween in said strain-relief area, and with said plurality of parallel, bare optical fibers in said plurality of parallel, longitudinally-extending grooves, and further in which a minor section of said top plate and said bottom plate of said precursor sandwich has been glued together.

32. A precursor sandwich which supports at least one optical fiber, said precursor sandwich comprising:

(a) a bottom plate in the form of a base substrate of a suitable material, a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, at least one longitudinally-extending groove along said longitudinally-extending axis, said at least one longitudinally-extending groove abutting said strain-relief area, a first transversely-extending trench across said substrate, and a second transversely-extending trench across said substrate remote from said first trench and adjacent an end of the substrate which is remote from said first trench;

(b) a top plate in the form of a base substrate of a suitable material, a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, at least one longitudinally-extending groove along said longitudinally-extending

axis, said at least one longitudinally-extending groove abutting said strain-relief area, a first transversely-extending trench across said substrate and a second transversely-extending trench across said substrate remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(c) at least one optical fiber within said strain-relief area of either said bottom plate or said top plate, and at least one bare optical fiber within said at least one longitudinally-extending groove of either said bottom plate or said top plate;

wherein:

(d) the precursor sandwich comprises said top plate which is superposed over said bottom plate, with said at least one optical fiber therebetween in said strain-relief area, and with said at least one bare optical fiber in said at least one longitudinally-extending groove, and further in which a minor section of the top plate and said bottom plate of the precursor sandwich has been glued together.

33. A precursor sandwich which supports a plurality of parallel optical fibers, said precursor sandwich comprising:

(a) a bottom plate in the form of a base substrate of a suitable material, a longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, a plurality of parallel, longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel, longitudinally-extending grooves abutting said strain-relief area, a first transversely-extending trench across said substrate and a second transversely-extending trench across said substrate remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(b) a top plate in the form of a base substrate of a suitable material, a

longitudinally-extending strain-relief area at one end thereof along a longitudinal axis thereof, a plurality of parallel, longitudinally-extending grooves along said longitudinally-extending axis, said plurality of parallel, longitudinally-extending grooves abutting said strain-relief area, a first transversely-extending trench across said substrate, and a second transversely-extending trench across said substrate remote from said first trench and adjacent an end of said substrate which is remote from said first trench;

(c) an array of optical fibers within said strain-relief area of either said bottom plate or the top plate, and a plurality of parallel, bare exposed optical fibers within the plurality of parallel, longitudinally-extending grooves of either said bottom plate or said top plate;

wherein:

(d) said precursor sandwich comprises the top plate which is superposed over said bottom plate, with said array of optical fibers therebetween in said strain-relief area, and with said plurality of parallel, bare optical fibers in said plurality of parallel, longitudinally-extending grooves, and further in which a minor section of said top plate and said bottom plate of said precursor sandwich has been glued together.

34. The precursor sandwich of any one of claims 30 to 33, wherein said strain-relief area extends longitudinally on both lateral sides of said first trench.

35. The precursor sandwich of any one of claims 30 to 33 24, wherein said strain-relief area extends longitudinally from said first trench only to said one end thereof.

36. The precursor sandwich of any one of claims 30 to 33, wherein said strain-relief area extends longitudinally from said one end thereof to stop short of said first trench.

37. The precursor sandwich of any one of claims 30 to 33, wherein said at least one optical fiber or said array of optical fibers, and said at least one bare optical fiber or said plurality of parallel bare optical fibers, is disposed at an angle beta to the central longitudinal axis of said precursor sandwich.

38. The precursor sandwich of any one of claims 30 to 33, in which said precursor sandwich has been cut adjacent an end which is remote from said first trench, and in which a portion of said top plate has been broken away;

thereby providing an exposed end of an optical fiber or exposed ends of said optical fibers.

39. The precursor sandwich of claim 38 in which said exposed optical fiber end or ends have been polished.

40. The precursor sandwich of claim 38 or claim 39, wherein the cut is tilted at an angle to the vertical.

41. The precursor sandwich of claim 38, claim 39 or claim 40, wherein said cut is in the form of a cut which has been cut completely through the top plate but only partly through said bottom plate.

42. The precursor sandwich of any one of claims 38 to 41, wherein said cut is disposed at an angle to the longitudinal axis of said precursor sandwich.

43. The precursor sandwich of any one of claims 38 to 42, wherein said bare exposed optical fiber or the plurality of parallel exposed optical fibers is, or are, disposed at an angle to the longitudinal axis of the precursor sandwich.

44. A half-sandwich comprising the precursor sandwich of any one of claims 30 to 43, in which the bottom plate has been broken away along the first trench thereof, in which a major unglued portion of said bottom plate has been removed; and whereby:

said half-sandwich includes said optical fiber array and at least one bare exposed optical fiber which is within the at least one groove, or the plurality of parallel exposed optical fibers are within the plurality of parallel grooves, said at least one bare exposed optical fiber, or said plurality of parallel exposed optical fibers depending from a face of said top plate and along the longitudinal axis of said half-sandwich.

45. A full sandwich comprising the half-sandwich of claims 44, in which the top plate has been broken away along the first trench thereof, in which a major unglued portion of said top plate has been removed; and whereby:

said full sandwich includes said optical fiber array and at least one bare exposed optical fiber which is cantelevered from said remaining minor portion of said top plate and said bottom plate, or said plurality of parallel exposed optical fibers which are cantelevered from said remaining minor portion of said top plate and said bottom plate and along the longitudinal axis of said full sandwich.

46. A waveguide comprising:

a waveguide substrate having two opposed lateral ends, each said lateral end including a plurality of parallel longitudinal grooves therein, and a central region abutting both the lateral ends, said central region including a plurality of parallel optical-fiber-coupling structures which abut said plurality of parallel grooves; and

an associated half-sandwich as claimed in claim 44 which is secured to an associated lateral end of the waveguide substrate, with said plurality of parallel exposed optical fibers within said plurality of parallel grooves in the lateral ends of said waveguide substrate, and also on contact with the plurality of parallel optical-fiber-coupling structures.

47. A waveguide comprising:

a waveguide substrate having two opposed lateral ends, each said lateral end including a plurality of parallel longitudinal grooves therein, and a central region abutting both the lateral ends, said central region including a plurality of parallel optical-fiber-coupling structures which abut said plurality of parallel grooves; and

an associated full sandwich as claimed in claim 45 which is secured to an associated lateral end of said waveguide substrate, with said plurality of parallel exposed optical fibers within said plurality of parallel grooves in the lateral ends of the waveguide substrate, and also on contact with said plurality of parallel optical-fiber-coupling structures.